

EXHIBIT A



Traveler Management System Context Level Analysis Model

Version 1.1.0

Proprietary and Confidential

Table of Contents

| | |
|-------------------------|-----------|
| USE CASE INTENTS | 4 |
| ACTOR CATALOGUE | 8 |
| USE CASE DIAGRAM | 13 |

List of Figures

| | |
|-------------------------------------|----|
| FIGURE 1 - LIST OF USE CASE INTENTS | 7 |
| FIGURE 2 - LIST OF ACTORS | 12 |
| FIGURE 3 - USE CASE DIAGRAM | 13 |

Use Case Intents

| Use Case Name | Intent |
|---------------------------------------|---|
| Communicate Information to TMS Users | Provide means to communicate information to and from TMS users. Information can be sent to individuals as well as 'collections' of TMS users (network, call center, etc.). |
| Generate Travel Documents | Provide means to generate travel documents, identify delivery or distribution methods, and submit request for delivery into TMS. Do not allow generation of tickets if pre-ticket dependencies are not met. Travel documents include tickets, itinerary, and shipping labels. |
| Identify Traveler | Provide means to uniquely identify and authenticate an individual traveler or travel arranger. |
| Maintain ARC Information | Provide means to setup and maintain ARC, IATA, STP's, PCC's, and other ARC related information. |
| Maintain Client Information | Provide means to create, update, delete, suspend or restore client related information. This information includes client descriptions, organization structure, policy, service contracts, rates, rules, and any other information specifically related to any one client. The rate information includes negotiated rates, rules, commissions, and any other tariff related information. |
| Maintain Client Status | Provide means to coordinate new client setup and configuration for implementation at a specified date. Provide views and/or reports to check or review status of system setup for any one client. |
| Maintain Configuration Information | Provide the means to configure and administer logistical information related to call center, network, telephony, skill sets and group definitions. |
| Maintain CWT Information | Provide means to create, update or suspend CWT related information. This information includes CWT service definitions and standard CWT client policies, rates, & rules. The rate information includes CWT negotiated rates, rules, commissions, and any other tariff related information. This information is not specific to any one client, vendor, or call center. |
| Maintain TMS Users | Provide means to create, update, and delete login and security information about all users of TMS. |
| Maintain Travel Counselor Information | Provide means to add, modify, and delete travel counselor information. This information includes personnel information, skill information, group assignments, etc. |
| Maintain Traveler Information | Provide means to add, modify, and delete individual traveler information. This information includes similar traveler information that the ProAct system maintains today. |

| Use Case Name | Intent |
|---|---|
| Maintain Vendor Information | Provide means to create, update, or delete vendor related information. This information includes vendor descriptions, vendor inventory types & codes, vendor amenities, and any other vendor information that is not specifically related to any one client. |
| Manage Service Tasks & Queues | Provide real-time monitoring and management of work flow tasks and work flow queues. Ability to query tasks & queues by client, team, or call center, or network wide. |
| Manage Unused Tickets | Provide means to track and recommend use of unused ticket documents, c-tickets and prepaids. Unused ticket documents will need to be physically secured in a similar manner to unissued accountable ARC documents. |
| Monitor Service Levels | Provide real-time monitoring of service levels. Ability to view service levels by skill, client, team, or call center, or network wide. Aggregate service level thresholds can be established for real-time notification to operations staff. |
| Monitor & Maintain Travel Counselor Performance | Provide operations real-time display of travel counselors logged into system, their statistics, and performance. Ability to view aggregates by individual, team, client based, or call center. Provide travel counselor display of elapsed time to provide a service to travelers. Also allow travel counselor to view own individual performance statistics and performance. |
| Package & Deliver Travel Documents | Provide interface and tools to assist printing, packaging, and delivery of travel documents. This includes sorted printing of travel documents (including itineraries) or labels where applicable, automated interface to overnight vendors to capture tracking numbers, and allow record of manual or special deliveries if applicable. Confirmations of delivery will be captured (if available from delivery vendor). Delivery information, status, and confirmation (if available) can be retrieved and researched by user. |
| Process Client Issues/Accolades | Provide means to capture client or traveler issues, accolades, or special requests (requests that are not part of standard services provided through system). Provide means to track status and update until closure. Allow categorization of information by issue type, vendor, client, agent, branch served, etc. |
| Process Deferred Work | Process deferred work that is generated internally and by external systems. This involves organizing and distributing deferred work items for processing. |
| Process Telephony Events | Provide interface to receive and/or initiate telephony events such as phone state changes and new call arrivals. |

| Use Case Name | Intent |
|---|--|
| Provide Call Routing Information | Provide information to external telephony systems in order to make call routing decisions. This information includes Travel Counselor skills and preferences, Traveler information, call segmentation information, and selected offerings. |
| Provide Client Information | Provide client information for external systems and reporting for TMS users. (see also 'Maintain Client Information') |
| Provide Client Service Information | Provide service and service level information, performance, and history to external systems. |
| Provide Configuration Information | Provide call center configuration, ARC configuration, and other related information required for back office systems. |
| Provide CWT Information | Provide reporting of CWT related information. (see 'Maintain CWT information') |
| Provide Help Desk Information | Provide means for Help Desk personnel to view and research TMS related issues. |
| Provide Operational Performance Information | Provide network and center operational, service, and performance information. Includes information containing travel counselors, clients, service & service levels, configurations, etc. Includes report summaries by client, skill sets, service, etc. call center or network wide. |
| Provide Travel Counselor Info & Performance | Provide standard reports to detail and summarize travel counselor information and performance statistics. Provide data feeds of travel counselor information to external system actors as needed. |
| Provide Travel Order Information | Provide detailed travel order information to external systems. |
| Provide Travel Related Information | Provide travel related information including: airport and destination information, vendor locations, vendor amenities, visa/passport requirements, travel alerts, instructions for refunds, exchanges, etc., delivery information, currency conversions, etc. |
| Provide Travel Reservation | Provides means to interact with traveler and/or travel arranger to search, filter, select, reserve, cancel, create, modify travel components from available vendor inventories. Provide ability to guide or enforce travel selections and payment in accordance with client policy, preferences, and negotiated rates. |
| Provide Travel Services | Provide means to access and deliver travel services to users of the system. Provide display of services that can be performed for current traveler or client. Provide list of current traveler or client 'cases' (which include any complete or incomplete travel orders). |
| Provide Traveler Information | Provide summary and detailed traveler information to external systems. |
| Provide Vendor Information | Provide reporting of vendor related information. (see 'Maintain Vendor Information') |

| Use Case Name | Intent |
|--|---|
| Search & Provide Inventory Information | Provide vendor schedule, availability, fares/rates & rule information. Allow flexible parameterization, partial requests, and/or combinability of requested information. Includes air, car, and hotel. |
| Systems Management | Provide means to configure, backup, monitor and troubleshoot networks, telephony, platforms (both desktop and server), databases, and applications both at the call center and central operations levels. |
| Track Ticket Inventory | Provide means to track unissued accountable ARC documents and provide notification to reorder on low inventory thresholds. |

Figure 1 - List of Use Case Intents

Actor Catalogue

| Actor Name | Description | Use Cases |
|----------------------------------|---|--|
| Account Manager | Person who is responsible for managing the relationship with the client. | Provide CWT Information, Provide Client Information, Provide Client Service Information, Provide Vendor Information |
| ARC Administrator | CWT staff who is responsible to setup and maintain ARC #'s, IATA, STP's, PCC's, and other ARC related information. | Maintain ARC Information |
| Client H/R System | Core client systems used to identify and describe employees as travelers. Used during initial setup and periodically to maintain traveler information. | Maintain Traveler Information |
| Client Information Maintainer | CWT or Client personnel who maintain client/CWT contracts, service agreements, client/vendor contracts and travel policy parameters for interpretation by CWT's systems (e.g., effective dates, time windows, class restrictions, fare rules, CRS usage). | Maintain Client Information |
| Computer Reservation Systems | Computerized Reservation Systems (Sabre, Worldspan, Apollo...) which provide a wide range of reservation and information services. | Generate Travel Documents, Process Deferred Work, Provide Travel Related Information, Provide Travel Reservation, Search & Provide Inventory Information |
| Consulting Data Warehouse System | Informational system used for analysis by Consulting Services. (This external system does not currently exist, therefore it will not be supported in TMS release 1) | Provide Client Information, Provide Client Service Information, Provide Travel Order Information |
| Customer Service Representative | CWT staff who work on post-trip tasks, including follow-up, documentation and research. They investigate issues and bring them to resolution. | Provide Travel Services |
| CWT Information Maintainer | CWT staff responsible for maintaining CWT information. | Maintain CWT Information |

| Actor Name | Description | Use Cases |
|--------------------------------|---|--|
| CWT Profile Scanner | Scans existing profiles from a CRS for clients that are not yet in the system, converting them into a format appropriate for loading as Traveler Information. This is an error prone process and the quality of existing CRS profiles may vary, so significant "cleaning" of the data may be necessary. | Maintain Traveler Information |
| Delivery Service Systems | External delivery system(s) such as FedEx, UPS, etc. | Package & Deliver Travel Documents |
| Global Matrix / WINGS Systems | The CWT back office systems which provide financial tracking of transactions between CWT, clients and vendors with reporting and interfaces to ARC / BSP. | Provide Client Information, Provide Configuration Information, Provide Travel Order Information |
| Help Desk | CWT Personnel that provide 1st line support for TMS questions and issues. | Provide Help Desk Information |
| Human Resources Coordinator | CWT personnel who perform staffing management and maintain all documentation and paperwork for hiring, terminations, counseling and benefits enrollment. | Maintain Travel Counselor Information, Provide Travel Counselor Info & Performance |
| Implementation Project Manager | CWT personnel who analyzes a customer's needs and determine the proper client setup and configuration parameters to meet the customer's needs. | Maintain Client Status |
| Incentives System | Operational system used to enter and manage staff incentive programs. | Provide Travel Counselor Info & Performance |
| Industry Relations | CWT personnel who work to optimize the interaction with major vendor and industry organizations. Maintains vendor commission information. | Maintain CWT Information, Maintain Client Information, Maintain Vendor Information, Provide Client Information, Provide Vendor Information |
| InterAct System | Information reporting and analysis | Maintain Client Information, Provide Client Information, Provide Travel Order Information, Provide Traveler Information |
| Lead Coach | CWT staff focused on identifying and fulfilling training needs of Travel Counselors, monitoring individual and team performance levels and providing supervision and guidance to an assigned team of Travel Counselors. | Maintain Travel Counselor Information, Monitor & Maintain Travel Counselor Performance, Provide Travel Counselor Info & Performance, Provide Travel Services |

| Actor Name | Description | Use Cases |
|---------------------------|--|---|
| Operations Analyst | Manages network strategies, coordinates system configurations, sets up call routing vectors and maintains call routing logic from a non-technical perspective. (They may be assigned either local to one call center or for the entire network.) | Maintain Configuration Information, Maintain TMS Users, Provide Operational Performance Information |
| Operations Coordinator | CWT personnel who is responsible for real-time process changes, addressing problems, and monitoring service levels in order to optimize work efficiency on a call center or network level. (Their scope may be either local to one call center or for the entire network, depending upon their assignment.) | Communicate Information to TMS Users, Manage Service Tasks & Queues, Monitor & Maintain Travel Counselor Performance, Monitor Service Levels, Provide Operational Performance Information |
| Operations Manager | CWT staff responsible for ensuring that end-user response times are acceptable, communication links are available and performed timely (e.g., e-mail, VRU, fax, Internet, CRS), and forecasting/planning to accommodate future workloads. Their goal is to make sure the entire operation for which they are responsible is running successfully. (Their scope may be either local to one call center or for the entire network, depending upon their assignment.) | Provide Operational Performance Information |
| Process Engineer | CWT personnel who uses Industrial Engineering techniques to design primary and deferred work flows, call management strategies, processes and system requirements for new service offerings, vendor connections, new business rules, new vendor agreements, new CRS formats, etc. | Provide Operational Performance Information, Provide Travel Counselor Info & Performance |
| Quality Assurance Manager | CWT Personnel who analyzes operational performance for the purpose of enhancing processes and quality. (This is a central operations function using aggregate data) | Provide Operational Performance Information |

| Actor Name | Description | Use Cases |
|-------------------------------|---|---|
| Service Manager | CWT staff who manages Lead Coaches and direct teams of Travel Counselors based upon performance directives. Provide guidance focused on managing their assigned teams. | Maintain Travel Counselor Information, Monitor & Maintain Travel Counselor Performance, Monitor Service Levels, Provide Operational Performance Information |
| Staff Management System | Travel agent staff management system (IEX) : Software tool for planning, staffing, and managing a call center. It uses historical information reported by the ACD system to establish basic assumptions on which call volume forecasts and staffing calculations are based. The software generates long range budget and staffing forecasts, creates and assigns employee schedules, tracks and manages the day's operations, and measures employee and call center performance. | Provide Travel Counselor Info & Performance |
| Supplier Systems | Systems which provide reservation services access to a specific vendor (Southwest Airlines or specific hotel reservation systems, for example.) | Provide Travel Related Information, Provide Travel Reservation, Search & Provide Inventory Information |
| Technical Support Analyst | CWT personnel who monitors, maintains, supports, and troubleshoots technology platforms, applications, databases, and networks. | Systems Management |
| Telecommunications Specialist | CWT personnel who designs and maintains telephony systems. | Maintain Configuration Information |
| Telephony Systems | Telephony systems include ACD, CTI server, and call management system. | Process Telephony Events, Provide Call Routing Information, Provide Travel Counselor Info & Performance, Provide Traveler Information |
| Ticket Processor | CWT or Client personnel who processes tickets, administers the delivery process and manages ticket stock inventory. | Generate Travel Documents, Package & Deliver Travel Documents, Track Ticket Inventory |

| Actor Name | Description | Use Cases |
|------------------|---|---|
| Travel Arranger | Individual who is representing an existing client of CWT who needs assistance creating new travel plans, obtaining travel information/advice, or changing travel plans for another individual. | Provide Travel Services |
| Travel Counselor | CWT staff responsible for fulfilling Traveler / Travel Arranger requests, performing associated tasks (deferred and non-deferred), and reviewing their individual actual performance against their goals. They also perform Customer Service tasks, such as work on post-trip tasks, including follow-up, documentation and research. | Monitor & Maintain Travel Counselor Performance, Process Deferred Work, Provide Travel Services |
| Traveler | Individual who needs assistance creating new travel plans, obtaining travel information/advice, or changing travel plans. | Provide Travel Services |

Figure 2 - List of Actors

EXHIBIT B



Traveler System Technical Requirements

-- Draft --

Table Of Contents

| | |
|---|----------|
| 1. OVERVIEW..... | 5 |
| 2. SYSTEM CAPABILITIES..... | 6 |
| 2.1 PLATFORM REQUIREMENTS | 6 |
| 2.1.1 Computing framework | 6 |
| 2.1.2 EWAS implementation | 6 |
| 2.1.3 Framework implementation | 6 |
| 2.1.4 Platform migration | 6 |
| 2.1.5 Scalability | 6 |
| 2.1.6 Onsite functions | 6 |
| 2.1.7 Component configuration | 6 |
| 2.2 SYSTEM ARCHITECTURE REQUIREMENTS | 7 |
| 2.2.1 Layered architecture | 7 |
| 2.2.2 Extensible architecture | 7 |
| 2.2.3 Multiple runtime versions | 7 |
| 2.2.4 Location transparency | 7 |
| 2.2.5 Availability and load balancing | 7 |
| 2.2.6 Year 2000 | 7 |
| 2.3 WORKFLOW MANAGEMENT REQUIREMENTS | 7 |
| 2.3.1 Workflow management | 8 |
| 2.3.2 Process integration | 8 |
| 2.3.3 Workflow modeling | 8 |
| 2.3.4 Workflow plan | 8 |
| 2.3.5 Performance monitoring | 8 |
| 2.3.6 Agent resource management | 8 |
| 2.3.7 Workflow triggering | 9 |
| 2.3.8 Escorted call transfer | 9 |
| 2.3.9 Event tracing | 9 |
| 2.3.10 Case log | 9 |
| 2.4 CTI REQUIREMENTS | 9 |
| 2.4.1 Call routing | 9 |
| 2.4.2 Voice / data integration | 9 |
| 2.4.3 Agent group | 9 |
| 2.4.4 Virtual call center | 9 |
| 2.4.5 Telephony device interface | 10 |
| 2.4.6 Telephony network interface | 10 |
| 2.4.7 Call routing performance | 10 |
| 2.4.8 Caller information | 10 |
| 2.5 EXTERNAL INTERFACE REQUIREMENTS | 10 |
| 2.5.1 CRS interface | 10 |
| 2.5.2 Insulation from external system changes | 10 |
| 2.5.3 Supplier system interface | 10 |
| 2.5.4 Back Office interface | 10 |
| 2.5.5 Client interface | 10 |
| 2.5.6 ATPCO - TBD | 11 |
| 2.5.7 Others as identified | 11 |
| 2.6 USER INTERFACE REQUIREMENTS | 11 |
| 2.6.1 Control of desktop | 11 |
| 2.6.2 System status information | 11 |
| 2.6.3 Access security | 11 |
| 2.6.4 Process status information | 11 |

| | |
|---|-----------|
| 2.6.5 Use of keyboard | 11 |
| 2.7 SYSTEM SERVICES | 11 |
| 2.7.1 Time service | 11 |
| 2.7.2 Printing services | 11 |
| 2.7.3 Fax services | 11 |
| 2.7.4 E-Mail services | 12 |
| 2.7.5 Web access | 12 |
| 2.7.6 Message broadcasting | 12 |
| 2.8 BUSINESS SERVICES | 12 |
| 2.9 SECURITY | 12 |
| 2.9.1 Single logon | 12 |
| 2.9.2 Authorization | 12 |
| 2.9.3 Business Services | 12 |
| 2.9.4 Password expiration | 12 |
| 2.9.5 Security violations | 12 |
| 2.10 TRANSACTION MANAGEMENT | 12 |
| 2.10.1 Transaction management | 13 |
| 2.10.2 Load balancing | 13 |
| 2.10.3 Prioritization | 13 |
| 2.11 BATCH PROCESSING (QUEUEING MECHANISM FOR DEFERRED TASKS) | 13 |
| 2.11.1 General functions | 13 |
| 2.11.2 Task scheduling | 13 |
| 2.11.3 Execution frequency | 13 |
| 2.11.4 Execution dependencies | 13 |
| 2.11.5 Priorities | 13 |
| 2.11.6 Queueing priority | 13 |
| 2.12 REPORTING | 14 |
| 2.12.1 Consistent format | 14 |
| 2.12.2 Custom reports | 14 |
| 2.12.3 Print pre-view | 14 |
| 2.12.4 Multiple prints | 14 |
| 2.12.5 Report regeneration | 14 |
| 2.12.6 Report distribution | 14 |
| 2.12.7 Canned reports | 14 |
| 2.12.8 Print scheduling | 14 |
| 2.12.9 Flexible printing schedule | 14 |
| 2.13 DECISION SUPPORT | 14 |
| 2.13.1 Data feed | 14 |
| 2.14 INTERNATIONALIZATION | 14 |
| 2.14.1 Global deployment | 14 |
| 3. VOLUMES, PERFORMANCE, SERVICE LEVELS | 15 |
| 3.1 VOLUMES | 15 |
| 3.1.1 Location Volumes | 15 |
| 3.1.2 Transaction Volumes | 15 |
| 3.1.3 User Volumes | 16 |
| 3.1.4 Data Volumes | 17 |
| 3.1.5 Deferred Task Volumes | 17 |
| 3.2 SYSTEM RESPONSE TIME | 17 |
| 3.3 AVAILABILITY | 17 |
| 3.3.1 Availability | 18 |
| 3.4 SERVICE LEVELS | 18 |
| 4. DATA REQUIREMENTS | 18 |
| 4.1 DATA DEFINITIONS | 18 |

Draft

| | |
|--|-----------|
| 4.1.1 Travel Policy..... | 18 |
| 4.1.2 Service Level Agreements between CWT & Customer..... | 19 |
| 4.1.3 Travel Person Profile/Preferences..... | 19 |
| 4.1.4 Customer Service Issues | 20 |
| 4.1.5 Trip Information (PNR) | 20 |
| 4.1.6 Agent Information..... | 21 |
| 4.1.7 Tariff and Industry Data..... | 21 |
| 4.1.8 Travel Supplier Data | 21 |
| 4.1.9 Organizational Data | 22 |
| 4.1.10 External Systems Data (CRS references)..... | 22 |
| 4.1.11 Physical Location Data | 22 |
| 4.1.12 Process Definition Data..... | 22 |
| 4.1.13 Agent Productivity Data | 23 |
| 4.1.14 Customer Transactional Activity Data | 23 |
| 4.1.15 Accounting Data (associated with above transactions)..... | 23 |
| 4.2 DATA ACCESS REQUIREMENTS | 24 |
| 4.2.1 User Role / Data group matrix | 24 |
| 4.3 DATA DISTRIBUTION REQUIREMENTS | 25 |
| 4.3.1 Data Location Transparency..... | 25 |
| 4.4 DATA MANAGEMENT REQUIREMENTS | 25 |
| 4.4.1 Backup / Recovery requirements | 25 |
| 4.4.2 Archival Requirements..... | 26 |
| 4.4.3 Data Consistency and Integrity Requirements..... | 26 |
| 5. SYSTEM MANAGEMENT ENVIRONMENT | 26 |
| Table 1 - Total Call Volume..... | 15 |
| Table 2 - Total Transaction Volumes by Transaction Type..... | 16 |
| Table 3 - Ticketing Volume..... | 16 |
| Table 4 - User Volumes | 17 |
| Table 5 - ExAct CRS Volumes per PNR | 17 |
| Table 6 - Data Usage by Actor..... | 24 |

1. Overview

This document identifies the technical requirements of the Traveler System. The technical requirements are driven by business and functional requirements as well as principles resulting from the CWT Enterprise-Wide Architecture Strategy (EWAS). The business requirements originate from existing documentation of the Magellan Vision and have not been validated by the business owners of the Traveler System. Follow-on drafts of this document should be based upon validated business requirements. Note that specific functional requirements are not covered in this document but any system or technical capabilities required to support those requirements are documented.

The technical system requirements, when met, will ensure the Traveler System will achieve the following objectives:

- Performance - the system will respond in a timely manner.
- Availability - users can access services and data when needed.
- Reliability - services operate in a consistently repeatable manner.
- Scalability - the system can grow in several dimensions, including the number of users, transaction volumes, amount of data, and the number of locations.
- Extensible - the system can be extended after the initial implementation to add new services, user interfaces, external interfaces, data sources, and business processes.
- Security - only authorized personnel can access services and data.
- Portability - the application can execute in a variety of environments.
- Reusable - system components can be reused in future applications.

The system requirements will be analyzed from the following three technical aspects: System Capabilities (section 2), Business Volumes, Performance and Service Levels (section 3), and Data Requirements (section 4).

NOTE: the sources of requirements are shown in italics.

NOTE: This draft uses the Word header numbering scheme for requirements. For any follow-on drafts, we will probably use a static numbering scheme to uniquely identify each requirement.

2. System Capabilities

2.1 Platform Requirements

2.1.1 Computing framework

The Traveler System architecture will be based on IBM's Open Computing Framework.
{EWAS Principle 17: Infrastructure Design will be Based on the IBM Open Computing Framework.}

2.1.2 EWAS implementation

Where the EWAS has identified preferred products, the Traveler System will try to use them when possible.
{EWAS Principle E3: Follow CWT and Technology Industry Standards.}

2.1.3 Framework implementation

The Traveler System must use tools and frameworks to create a system that is capable of operating in a heterogeneous mix of operating environments. The system architecture must not be dependent upon specific server hardware or operating system platforms.

2.1.4 Platform migration

The Traveler System development life cycle must provide an incremental growth path without migrating to another platform.
{EWAS Principle A6: Build Scaleable Applications.}
{EWAS Principle 14: Provide Infrastructure Scalability.}

2.1.5 Scaleability

The Traveler System must support a range of call center sizes. In order to accomplish this, the system must be horizontally and vertically scaleable. Horizontal scaleability means that additional processing nodes can be implemented to provide more system throughput. Vertical scaleability means that individual processing nodes can be upgraded with additional resources, such as more powerful CPU's and more memory, to provide more throughput and better performance.
It is assumed that the minimum number of agent workstations in any call center is 50.
{EWAS Principle A6: Build Scaleable Applications.}
{EWAS Principle 14: Provide Infrastructure Scaleability.}

2.1.6 Onsite functions

Only a subset of Traveler System capabilities will be supported for onsite locations. This subset will be defined at a later time.

2.1.7 Component configuration

The Traveler System must support flexible configuration and deployment options. Selected individual components must be deployable independently of other components. The determination

of which components are separately deployable is based on business requirements and will be defined later.

2.2 System Architecture Requirements

2.2.1 Layered architecture

The system architecture must be a layered one with maximum independence between layers. Components within a layer must present a common and consistent interface to all other components in the surrounding layers. On principle, there should not be ability to bypass layers in the architecture. For example, the user interface layer should always access data sources through the business services layer. Whenever it is possible one should not bypass the business services layer to access the data source directly.

{EWAS Principle A2: Leverage Reusable Components and Technology Services When Developing Applications.}

{EWAS Strategy S4: Object-Oriented, Multi-Tier Development Strategy.}

2.2.2 Extensible architecture

The architecture must be extensible, allowing for the addition of business services, system services, user interface methods, and data sources beyond the initial implementation.

2.2.3 Multiple runtime versions

The Traveler System architecture must support the deployment of multiple versions of system components. For example, one call center may be using version 3 of the booking service while another call center is still using version 2 of the booking service.

2.2.4 Location transparency

The Traveler System must present the user with a single system image. Users must have access to the services and data required to perform their job regardless of where the service or data is physically located and regardless of where the user is physically located. Users must not need to know where services or data reside in the system in order to use them.

{EWAS Principle D3: Provide Authorized Accessibility to Enterprise Data any Time, Anywhere.}

{EWAS Principle I2: Provide Seamless, Global Access to the Extended Enterprise Voice and Data Network.}

2.2.5 Availability and load balancing

The system must provide a means of replicating critical services and other components for both availability and load balancing purposes.

{EWAS Principle I4: Provide Infrastructure Scalability.}

{EWAS Principle I3: All Infrastructure Components to Meet Service-Levels Defined by the Business.}

2.2.6 Year 2000

The system must correctly compute dates into the next century.

2.3 Workflow Management Requirements

In order to achieve the CWT's business objective of providing clients with quality services by agents who are organized in large call center split sizes, the concept of a workflow process style is introduced. From the

Draft

perspective of human/system interaction, the execution of travel arrangement processes can be drastically simplified through the use of a workflow management system. In the new Traveler System, a workflow management system will provide agents with pre-defined workflow plans where client specific information and procedures are embedded in each workflow plan. This enables the agents to support multiple client accounts.

During daily operations, the quality of each workflow plan can be further enhanced through on-going optimization. The use of such workflow plans will not only force agents to follow travel arrangement processes in a more disciplined manner, but also enable agents to deliver quality services which are much less dependent on the agents and their experiences.

The implementation of a workflow system also allows CWT management to capture and analyze data about agent productivity and utilization as well as system performance. Statistical and detailed information on how each travel request is processed (through call and non-call related tasks) and how each agent spends her/his time each day are critical for future business improvement and making CWT operations more profitable.

{Traveler Management deck, February 1996}

{Traveler Management July AFE}

{Draft Traveler System Business Requirements, February 1997}

2.3.1 Workflow management

The system should provide capabilities for managing and executing the business process cycle as one integrated operation. The business process cycle begins with the handling of incoming calls and is completed upon fulfillment of the travel business request.

2.3.2 Process integration

The system should enable call center management staff to integrate call routing operations with travel arrangements and then subsequent deferred tasks as a seamless process.

2.3.3 Workflow modeling

The system should adhere to the architectural models and implementation guidelines published by the Workflow Management Coalition standard setting body. The participants (nodes) of the workflow engine must include human resources, system supplied peripheries, 3rd party services (E-mail, fax,...) and fully customized functions such as deferred tasks.

2.3.4 Workflow plan

The system must supply a mean for designing and editing workflow plans. The system needs to be able to maintain multiple versions for each plan. Business analysts should be able to revise and deploy new plans dynamically without shutting down the Traveler System.

2.3.5 Performance monitoring

The system should provide mechanisms for monitoring functional task performance (overall and between steps in a workflow process) with granularities specified by business analysts. Performance and measurement data collected during the workflow process should be accessible by business analysts for call center or enterprise-wide performance analysis or event tracing purposes.

2.3.6 Agent resource management

The system should provide functions to allow the business management staff to arrange agents' work based on criteria such as agent's skills, task priority, permissions, and volume of calls at the time.

2.3.7 Workflow triggering

The system should enable workflow process be initiated from multiple triggering mechanisms such as Internet browser, E-mail, IVR, CTI, and existing workflow plan.

2.3.8 Escorted call transfer

The system must provide an escorted call transfer mechanism where one agent would be able to introduce the traveler to another agent who is going to take over the call before the call is completely forwarded.

2.3.9 Event tracing

The system must provide a mechanism for call center management staff to trace call and non-call events.

2.3.10 Case log

The system should provide agents a mean to re-activate call cases from a case log system.

2.4 CTI Requirements

Various CTI technologies are currently being used in today's call center operations at CWT. However, in order to make the call center operations more economical and flexible, advanced CTI technologies are required. The following are system requirements that allow the concept of a virtual call center with large split size attainable in the future.

{ Traveler Management deck, February 1996}

{Traveler Management July AFE}

{Draft Traveler System Business Requirements, February 1997}

2.4.1 Call routing

The system must be able to route and manage incoming calls based on agent's skills and availability, service requested, and volume of incoming calls at each call center.

2.4.2 Voice / data integration

The system should be built on an architecture that handles information and communication through voice and data concurrently. The system should be able to forward a call with associated data (both IVR and traveler information) from one agent to another without interruption with an utility such as a 'screen pop'.

2.4.3 Agent group

The system should be able to route calls to agent groups based on CWT defined rules. Each call is then routed to the next available agent in the target group. The CTI system should be notified at the call destination (agent's desktop address) and should forward the caller's information to the agent's desktop.

2.4.4 Virtual call center

The CTI system should allow CWT to build virtual call center(s) where multiple branch offices would be able to operate under one logical call routing system. *This ability should help CWT to share agent resources throughout the virtual call center and maximize agent utilization and productivity.*

2.4.5 Telephony device interface

The system should be able to interface with ACD and IVR equipment from different manufacturers currently installed at each site.

2.4.6 Telephony network interface

The system should provide a capability to interface with multiple carrier networks.

2.4.7 Call routing performance

The system must allow agents to respond to customer calls promptly. The time between when the customer finishes up IVR procedure and the call arrives at an agent's desk should be as short as possible.

2.4.8 Caller information

The system must be able to provide agents with adequate information about the caller and the nature of the caller's request at or before the call is routed to the agent's desk. The information includes caller DNIS (Dialed Number Information System), ANI (automatic Number Identification), caller-entered responses through IVR, and customer profile from other CWT, CRS databases.

2.5 External Interface Requirements

2.5.1 CRS interface

The Traveler System must interface to multiple Computer Reservation Systems. The CRS interface subsystem must be flexible enough to allow for the addition of additional CRS interfaces in the future.

2.5.2 Insulation from external system changes

The CRS interface subsystem must be resilient from supplier system changes. There must be a notification mechanism in place for situations when supplier system changes may affect the Traveler System operation.

2.5.3 Supplier system interface

The Traveler System must interface to selected supplier systems. Additional supplier systems will be identified over time. The Traveler System must include a flexible supplier interface subsystem which allows for the future addition of specific supplier interfaces.

2.5.4 Back Office interface

The Traveler System must support the integration with CWT's Back Office system. The Traveler System must provide the Back Office system with timely and accurate invoice data.

2.5.5 Client interface

The Traveler System must support the interface with client HR systems for the transfer of client and profile data.

2.5.6 ATPCO - TBD

2.5.7 Others as identified.

2.6 User Interface Requirements

2.6.1 Control of desktop

The agent workstation configuration (including OS and applications) will be controlled centrally via the LAN and not modifiable by the agent. There may be a set of agent preferences that the agent can control from within a desktop application. { some of large CWT branches 'lock' desktop today to reduce desktop maintenance and support costs }

2.6.2 System status information

Agent user interface will always maintain and depict to agent current availability of major system functions. { current CRS interface identifies CRS host availability }

2.6.3 Access security

The agent user interface will provide security by requiring agent to enter user ID and password to gain access to workstation applications. { CRS requires agent ID & password today }

2.6.4 Process status information

The user interface will depict to agent what work is 'saved' or 'unsaved' and system will provide means to 'save' important data (may be direct or indirect through completion of user tasks). In event of a reboot or power down of an agent workstation, the system will not maintain 'unsaved' user interface state or data. { CRS today provides means for agent to 'end record' and save work }

2.6.5 Use of keyboard

Agent user interface must be 'keyboard centric', meaning trained agent will not be required to use mouse to navigate and enter data while performing work or tasks. User interface will provide mouse navigation and control where beneficial for novice user. { It is assumed and accepted practice today that keyboard is more productive to use than mouse and keyboard together. }

2.7 System Services

2.7.1 Time service

The Traveler System must support a distributed time service which synchronizes the clocks on all system components.

2.7.2 Printing services

Printing services must be provided from the Traveler System desktop.

2.7.3 Fax services

Fax services must be provided from the Traveler System desktop.

2.7.4 E-Mail services

E-Mail services must be provided from the Traveler System desktop.

2.7.5 Web access

Web access must be provided from the Traveler System desktop.

2.7.6 Message broadcasting

The Traveler System must provide real-time message broadcast and multicast capability.

2.8 Business Services

Specific requirements for business services can't be determined until the desired business condition is defined. These requirements should be added in follow-on versions of this document. These business services may include: ticketing, availability, booking, tariff, corporate policy, traveler profile, credit card, information, customer service, upgrade services, waitlist services, seat services, fare reduction, record finishing, distribution, etc.

2.9 Security

2.9.1 Single logon

Users of the Traveler System require a single user id and password to access all Traveler applications. Once a user has accessed the system using this single sign-on, no additional passwords are required to access additional system services.

2.9.2 Authorization

Access to system functionality is controlled by user and user group authorizations. The default security authorization should be not to allow access unless specifically granted.

2.9.3 Business Services

Traveler System security must be implemented in the Business Services layer.

2.9.4 Password expiration

A password aging scheme must be used.

2.9.5 Security violations

All security violations must be automatically logged. Automatic notification to security administrators must happen when severe security violations occur.

2.10 Transaction Management

The Traveler System has transactional characteristics, as well as inquiry characteristics. An example of a transaction is booking a reservation, where information in one or more data stores is created or updated. The characteristics of transactions are high throughput, high performance and reliability. An example of an inquiry is availability searching, where information is merely read, not updated. Sophisticated analytical or ad-hoc query type of applications (such as a decision support system) are not supported in the Traveler System although the Traveler System will provide data feeds to such systems.

2.10.1 Transaction management

The Traveler System must provide transaction management capabilities which ensure the ACID properties of transactions are maintained. ACID stands for atomicity, consistency, isolation, and durability. Atomicity means that all actions within a transaction succeed or they all fail. Consistency means the system must be in a consistent state after the transaction executes. Isolation means that concurrent transactions are not affected by each other. Durability means that the results of a transaction are persistent.

2.10.2 Load balancing

The Traveler System must be capable of static and dynamic transaction load balancing. Static load balancing means that transactions are distributed across multiple pre-defined processing resources. Dynamic load balancing means the system can allocate additional processing resources at run time, either within the same physical node or across nodes. Examples of resources which can be allocated include processes and threads.

2.10.3 Prioritization

The Traveler System must provide the capability to prioritize transactions and manage the execution of transactions based on these priorities for the purposes of tuning performance and maximizing throughput.

2.11 Batch Processing (Queuing mechanism for deferred tasks)

Batch processing is the queuing mechanism for deferred task execution. Note that the term queue in the following discussion is not referring to a CRS queue.

2.11.1 General functions

The Traveler System must include a batch processing subsystem which is capable of executing a variety of tasks, from reports to deferred tasks.

2.11.2 Task scheduling

It must be possible for the system, as well as users, to schedule tasks.

2.11.3 Execution frequency

It must be possible to specify a specific date and time for a task to execute one time only, as well as a repeating schedule of dates and times.

2.11.4 Execution dependencies

The Traveler System must provide the capability of specifying inter-job or inter-task execution dependencies.

2.11.5 Priorities

There must be the capability of specifying execution classes of service or job priorities.

2.11.6 Queuing priority

The batch subsystem must provide the capability to alter the queue of tasks. These capabilities include altering task priorities, deleting tasks, and inserting tasks at any point in the queue. The queuing mechanism must not be a simple FIFO implementation.

2.12 Reporting

2.12.1 Consistent format

Title, page number, report name, report date, run date, and time are shown consistently on all reports.

2.12.2 Custom reports

Tools are provided to create custom reports.

2.12.3 Print pre-view

Provides choice of printing directly or viewing on monitor and then route to a printer.

2.12.4 Multiple prints

Provides ability to print multiple copies per request.

2.12.5 Report regeneration

Able to regenerate reports. It is assumed there is no requirement to archive report output.

2.12.6 Report distribution

Provides automated report distribution facilities using various distribution capabilities (print, e-mail, fax).

2.12.7 Canned reports

Provides predefined reports.

2.12.8 Print scheduling

Provides the ability to execute a report immediately or at a future date and time.

2.12.9 Flexible printing schedule

Provides the ability to run a report one time only or to specify a repeating execution schedule.

2.13 Decision Support

2.13.1 Data feed

The Traveler System must provide a data feed to external decision support applications, such as a workforce scheduling tool. The Traveler System does not provide decision support capability or ad-hoc query capability directly.

2.14 Internationalization

2.14.1 Global deployment

The Traveler System must support international capabilities to support global deployment. These capabilities include multi-lingual, multi-currency, multi-measurements, multi-national address and phone, and different character sets. {EWAS Principle A4: Include International Capabilities in the Development of Applications.}
{EWAS Strategy S5: Multi-National Development and Deployment Strategy.}

3. Volumes, Performance, Service Levels

3.1 Volumes

Volume information needs to be defined for several different aspects of the Traveler System, including number and size of locations, inbound and outbound calls, business transactions, user/system interactions, CRS transactions, transactions with external systems, deferred task transactions, users, and the amount of data stored in the Traveler System database. In some cases, the volumes are network wide totals while in other cases it is on a per agent basis. Typical and peak volumes are required as well as growth projections. This draft contains volume information which is raw data that has been extracted from other sources. Any follow-on drafts should contain more analysis of the data and include contingencies and growth projections.

3.1.1 Location Volumes

3.1.1.1 Call center size

The Traveler System will support various sizes of call centers but the minimum number of CSR workstations at any center is 50. (It is assumed the number of call centers in North America is on the order of 20 with the total number of agents around 800 to 1000.)

3.1.2 Transaction Volumes

3.1.2.1 Call Volumes

The following call volumes are US totals only.

| Incoming Calls | | Annual | Monthly | Weekly | Daily | Hourly |
|----------------|------------------------------|-------------------|------------------|----------------|---------------|--------------|
| | Local | 4,715,644 | 392,970 | 90,685 | 18,137 | 2,267 |
| | Long Distance (incoming 800) | 8,757,624 | 729,802 | 168,416 | 33,683 | 4,210 |
| | Total Incoming Calls | 13,473,268 | 1,122,772 | 259,101 | 51,820 | 6,478 |

| Outgoing Calls | | Annual | Monthly | Weekly | Daily | Hourly |
|----------------|-----------------------------|-------------------|----------------|----------------|---------------|--------------|
| | Local | 2,813,493 | 234,458 | 54,106 | 10,821 | 1,353 |
| | Long Distance | 5,626,986 | 468,916 | 108,211 | 21,642 | 2,705 |
| | Outgoing Toll-Free | 2,813,493 | 234,458 | 54,106 | 10,821 | 1,353 |
| | Total Outgoing Calls | 11,253,972 | 937,831 | 216,423 | 43,285 | 5,411 |

Table 1 - Total Call Volume¹

3.1.2.2 User/System Interaction Volumes

¹ Annual figures are from the Branch Management Blueprint Document, dated February 6, 1996. Other figures are derived from this information.

Draft

| Transaction Type | Annual | Monthly | Weekly | Daily | Hourly | % of Total |
|--------------------------|-------------------|------------------|----------------|---------------|-------------|-------------|
| New Reservation | 3,784,884 | 315,407 | 72,786 | 15,770 | 1971 | 24% |
| Changed Reservation | 2,584,800 | 215,400 | 49,708 | 10,770 | 1346 | 16% |
| Cancel Reservation | 276,948 | 23,079 | 5,326 | 1,154 | 144 | 2% |
| Request Information | 5,908,116 | 492,343 | 113,618 | 24,617 | 3077 | 37% |
| Problem/Customer Service | 276,948 | 23,079 | 5,326 | 1,154 | 144 | 2% |
| Other | 3,046,368 | 253,864 | 58,584 | 12,693 | 1587 | 19% |
| Total | 15,878,064 | 1,323,172 | 305,347 | 66,159 | 8270 | 100% |

Table 2 - Total Transaction Volumes by Transaction Type²

Any follow-on drafts of this document need to contain the following volume information:

- hourly peak volumes
- per agent volumes
- growth projections
- car and hotel volumes
- breakout "other category" into more detail

| Delivery Method | Annual | Monthly | Weekly | Daily | Hourly |
|-----------------|------------------|----------------|---------------|---------------|--------------|
| E-Tickets | 207,715 | 17,310 | 3,995 | 799 | 100 |
| Printed Tickets | 3,946,575 | 328,881 | 75,896 | 15,179 | 1,897 |
| Total | 4,154,290 | 346,191 | 79,890 | 15,978 | 1,997 |

Table 3 - Ticketing Volume³

3.1.2.3 CRS Transaction Volumes

No information available for this draft. Follow-on drafts need to classify these volumes by CRS and type of transaction.

3.1.2.4 External System Transactions

No information available for this draft. Follow-on drafts need to classify these volumes by type of transaction and which external system is involved.

3.1.3 User Volumes

User volumes are not available at this time.

² Branch Management Blueprint Document, Appendix V-9.

³ Annual figures from the Branch Management Blueprint Document.

Draft

| Job Category | Roles | Concurrent Users | | Total Users | |
|-----------------------|---|------------------|------------|-------------|------------|
| | | Currently | In 5 Years | Currently | In 5 Years |
| Travel Consumers | Traveler | | | | |
| | Travel Arranger | | | | |
| Service Providers | Customer Services Representative | | | | |
| | Deferred Services Representative | | | | |
| | Service Representative Coach | | | | |
| | Ticket Processor | | | | |
| Rule Management | Client Policy Rule Maintainer | | | | |
| | Traveler Profile and Preference | | | | |
| | Client / Vendor Contract Maintainer | | | | |
| | Client Information Reference Maintainer | | | | |
| | CWT Rule Maintainer | | | | |
| | CWT / Client Contract and Services Maintainer | | | | |
| Information User | CWT Information Reference Maintainer | | | | |
| | Client Trend / Forecasting Analyst | | | | |
| | CWT Trend / Forecasting Analyst | | | | |
| | Incentives Coordinator | | | | |
| Operations Management | Operations Coordinator | | | | |
| | Scheduling and Forecasting | | | | |
| | Technical Operations Manager | | | | |
| | Accountant | | | | |
| | CWT / Vendor Linkage Coordinator | | | | |

Table 4 - User Volumes⁴

3.1.4 Data Volumes

A matrix of major entities showing volumes needs to be developed for follow-on drafts of this document.

3.1.5 Deferred Task Volumes

The following are current volumes for the ExAct suite of products.

| Service | PNR's Processed | Total CRS Commands | CRS Commands per PNR |
|-----------------|-----------------|--------------------|----------------------|
| SeatCheck | 16 | 149 | 9.3 |
| Sabre Audit | 8 | 600 | 75.0 |
| Low-fare Search | 6 | 439 | 73.2 |

Table 5 - ExAct CRS Volumes per PNR⁵

3.2 System Response Time

While no specific response time requirements have been identified yet, the expectation is that agents are not waiting long periods for the system to process requests. We need more detailed tasks and cycle times from the business in order to define system response times.

3.3 Availability

In follow-on drafts, we may define availability requirements for each individual business service.

⁴ Job Titles from Draft Traveler System Business Requirements, February 24, 1997.

⁵ Kurt Sleighter E-mail dated 4/14/97

3.3.1 Availability

The data center must be available 24 x 7 with a 6 hour period of low expected volumes and less strict performance requirements.

{EWAS Principle I3: All Infrastructure Components to Meet Service-Levels Defined by the Business.}

3.4 Service Levels

The Traveler System must support the capability to define and monitor service levels. Note: it is assumed that achieving call answering service levels is primarily a staffing issue so specific targets are not mentioned here.

4. Data Requirements

4.1 Data Definitions

The following section describes the major sets of data required for the Traveler Management System to function. It is organized and presented in a manner which the business views this information, not in as a systematic detailed Entity-Relationship diagram. The purpose of this approach is to support the development a conceptual data architecture, which will refer to these high level logical groups of data. These data definitions are based on current understanding of the business. There is a need to perform follow-on data analysis to validate this list before finalizing this document.

For auditing and data management purposes, all data must have standard attributes to track the last modification date/time, user identifier, etc. Transactional data must also selectively maintain historical changes for the useful life of those transactions.

{This information was gathered from several sources, including the earlier Magellan decks, The CWT Global Data Model, the Pre-draft version of the Business Requirements, the July AFE and early drafts of the Business Team Solution Definition.}

4.1.1 Travel Policy

4.1.1.1 Customer Id

It is necessary to uniquely identify each traveler and this must meet the business requirements to allow customers to define the identifier within their organization. For example, if an customer organization has a unique employee number for each individual, then there should be a means to use this in the system when a user wants to find information about that individual. While, for systematic reasons, an internal identifier may be generated, it must map upon a user defined identifier or concatenated set of identifiers.

4.1.1.2 Policy Data

In order for the fulfillment engine to operate, the customer's rules for travel must be parameterized and stored for business logic routines to apply. The codification of such information will present a great challenge to the data designers and business implementation team because of the dynamic form these rules may take. This information would include the following items.

- Negotiated Fares/Rates
- Travel Authorization policy
- Upgrade policy

Draft

- Airline Class policy
- Notification of groups
- Hotel policies
 - Preferred properties
 - Alternative properties
 - per diem limits
 - upgrade restrictions
 - Late arrival guarantees
 - excluded properties
- Car Rental policies
- Train policies
- Personal Trip policies

4.1.2 Service Level Agreements between CWT & Customer

The system must record what has been agreed between CWT and the customer so that automated reporting systems can alert users when the levels approach critical values.

4.1.3 Travel Person Profile/Preferences

This information, some of which is currently captured in the CRS and ProAct data structures, must be flexible in order for extensions to be added when the system when required. This data source will be relied upon to provide all types of information to agents in order to them to understand and meets the unique needs of each traveler.

4.1.3.1 Personal Data

- Name
- Title
- Employee identification (employee number)
- Work Address
- Home Address
- E-mail Address
- Ticket Delivery Address
- Phone numbers (Work, Home, Fax, Pager, Cellular)
- Passport/Visa Data
- Citizenship
- Visa Status
- Credit Card Data

4.1.3.2 Preferences

- Air preferences
 - Seating
 - Meals
 - Class upgrades
- Hotel Preferences
 - preferred properties
 - Room type
 - Bed type
 - Late arrival guarantee info
- Car preferences
 - Vendor
 - Car make
 - Car size/type
 - Insurance info

Draft

- Documentation preferences
 - E-Ticket
 - Itinerary
- Notification preferences
 - E-mail, mail, fax, voice, courier
 - Delivery to home / office

4.1.3.3 Customer Organizational Reference

- Company
- Department
- Travel Authorization Data
- Traveler Type (TravelPlus category)

4.1.3.4 Travel Supplier Club Information

- Frequent Flier Numbers
- Travel Club memberships

4.1.3.5 Trip References

- Previous Trips
- Outstanding Trips

4.1.4 Customer Service Issues

- Traveler Name
- Traveler Company Reference
- Issue Description
- Issue Severity Level
- Status
- Responsibility Data (who is assigned)
- Supplier Reference
- Trip Reference
- Dates
- Creation Date/Time
- History of activity
- Resolution Date/Time

4.1.5 Trip Information (PNR)

- Record Identifier
- Traveler Name
- Phone Info
- Passenger Type Codes
- Reserved Segments
 - Carrier
 - Origination
 - Destination

Draft

4.1.5.1 Misc. Segments

4.1.5.2 Ticket Info

4.1.5.3 Special Service Requests

This information captures any requests for special meals and services on a trip.

4.1.5.4 Other Service Items?

4.1.5.5 Comments/Remarks

4.1.5.6 Accounting Info (UDID's)

- Accounting Information
- Reason Codes
- Booking Agent Id
- Savings Codes
- Client Organization References

4.1.5.7 Branch / DK References

- Client
- STP
- Type of Travel (Leisure vs. Commercial)
- Any other attributes for customer reporting categories.

4.1.6 Agent Information

4.1.6.1 CWT Organizational References

- Work Groups
- Incentive Data

4.1.6.2 Skill Proficiency Data

- Customer Policy Knowledge
- CRS proficiency
- Tasks capabilities (to which tasks can they be assigned)

4.1.6.3 Availability Status Data

This data is highly dynamic.

4.1.7 Tariff and Industry Data

- Airport City Codes
- Fare Classes
- Aircraft Code designations

4.1.8 Travel Supplier Data

4.1.8.1 General Supplier Data

- Name

Draft

- Address
- Phone Numbers
- Vendor Code

4.1.8.2 Supplier Inventory

- Specific Service (Flight/Hotel/Car) Availability
- General Service Data (Flight Times, etc.)

4.1.9 Organizational Data

4.1.9.1 Customer Organization

- Organizational Hierarchy (Company, Division, Department, ...)
- Travel Management Organization
 - Manager Contacts

4.1.9.2 CWT Organization

- Organizational Hierarchy (Company, Division, Region, Branch...)

4.1.10 External Systems Data (CRS references)

4.1.10.1 Pseudo City Codes

4.1.10.2 ARC Codes

4.1.10.3 Satellite Ticket Printer (STP) Data

4.1.11 Physical Location Data

4.1.11.1 Valid Pseudo City Codes

4.1.11.2 Associated ARC Codes

4.1.11.3 Satellite Ticket Printer (STP)

4.1.12 Process Definition Data

This is the means to store workflow definitions by describing tasks, their relationships and dependencies upon each other.

4.1.12.1 Task TypeDefinitions

This must be defined to down to the level of granularity which the business chooses to manage.

4.1.12.2 Task Relationships

When defining workflow processes, it is necessary to specify the order in which tasks must be executed and any dependencies between those tasks.

4.1.13 Agent Productivity Data

4.1.13.1 Agent Id

Each agent must be uniquely identified within the system so that productivity can be monitored.

4.1.13.2 Tasks Performed

This is an instance of a Task which is performed by an agent or other resource. It is the basis for workflow management and productivity tracking.

- Task Type
- Start time
- Deadline for completion
- Actual End time
- Total time spent

4.1.14 Customer Transactional Activity Data

While this information is crucial to the back office functions, it is initially input by the agents as they perform their work. It is necessary to recognize that the front office is the originator of these transactions.

4.1.14.1 Reservation Transactions

4.1.14.2 Ticketing Transactions

4.1.14.3 Document Delivery Transactions

4.1.14.4 Other Transactions

4.1.15 Accounting Data (associated with above transactions)

4.1.15.1 ADS DK

Question for follow-on analysis: How will this be handled with Global Matrix?

4.2 Data Access Requirements

4.2.1 User Role / Data group matrix

The following table documents what data is required by the various user roles within Traveler. It is presented in a modified CRUD matrix format to simplify the generalized access requirements. This matrix is based on our current understanding of the Traveler System requirements and needs to be validated with the business.

{Roles from Predraft Business Requirements document, values within matrix to be validated by Business Team and Subject Matter Experts}

Legend: R = Read only access, O = Create, Update, Delete access, N/A = No Access

| Legend R=Read O=Owns N/A=No Access | Data Category | Travel Policy | Customer SLA's | Traveler Profiles | Trip Info | Fare Info | Avail Info | Customer Org Info | CWT Org Info | Location Info | Process Definitions | Agent Producti vity | Customer Transacti ons | Acctng Data |
|--|---|------------------|-------------------|----------------------|--------------|--------------|---------------|----------------------|-----------------|------------------|------------------------|---------------------------|------------------------------|----------------|
| Role Category | Roles | | | | | | | | | | | | | |
| Travel Consumers | Traveler | R | R | O(1) | O(1) | R | R | | N/A | N/A | N/A | N/A | O(1) | N/A |
| | Travel Arranger | R | R | R | O(1) | R | R | O? | N/A | N/A | N/A | N/A | O(1) | R |
| | Customer Services Representative | R | R | R | O(2) | R | R | R | R | R | R | R | O(2) | O(4) |
| | Deferred Services Representative | R | R | R | O(2) | R | R | R | R | R | R | R | O(2) | O(4) |
| Service Provider | Service Representative | R | R | R | O(2) | R | R | R | R | R | R | R | O(2) | O(4) |
| | Coach | R | R | R | O(2) | R | R | R | R | R | R | R | O(2) | O(4) |
| | Ticket Processor | R | R | R | O(2) | R | N/A | R | R | R | R | R | O(2) | O(4) |
| | | | | | | | | | | | | | | |
| Rule Management | Client Policy Rule Maintainer | O | R | R | N/A | N/A | N/A | R | N/A | R | R | R | N/A | N/A |
| | Traveler Profile and Preference Maintainer | R | R | O | N/A | N/A | N/A | R | N/A | R | R | R | N/A | N/A |
| | Client / Vendor Contract Maintainer | O | R | R | N/A | N/A | N/A | R | N/A | R | R | R | N/A | N/A |
| | Client Information Reference Maintainer | R? | R | R | N/A | N/A | N/A | O | N/A | R | R | R | N/A | N/A |
| Information User | CWT Rule Maintainer | R | O | R | N/A | N/A | N/A | R | R | R | O | R | N/A | N/A |
| | CWT / Client Contract and Services Maintainer | R | O | R | N/A | N/A | N/A | R | R | R | R | R | N/A | N/A |
| | CWT Information Reference Maintainer | N/A | R | R | N/A | N/A | N/A | O | R | R | R | N/A | N/A | R |
| | Client Trend / Forecasting Analyst | R | R | R? | R | R | N/A | R | R | R | R | N/A | R | R |
| Operations Management | CWT Trend / Forecasting Analyst | R | R | R? | R | R | N/A | R | R | R | R | R | R | R |
| | Incentives Coordinator | R | R | R | R | R | N/A | N/A | R | N/A | R | R | R | R |
| | Operations Coordinator | N/A | R | R | R(3) | R | N/A | N/A | R | R | R | R | R(3) | R |
| | Scheduling and Forecasting Technical Operations Manager | R | R | R | R(3) | R | N/A | N/A | R | R | R | R | R(3) | R |
| Systems | Accountant | R | R | R | R(3) | R | N/A | R | R | R | R | R | R(3) | O |
| | CWT / Vendor Linkage Coordinator | R | R | R? | R(3) | R | N/A | N/A | R | O? | R | N/A | R(3) | N/A |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| Notes | Back Office | R | ? | N/A? | R | R | N/A | R | R | N/A | N/A | N/A | R | O? |
| | Supplier Systems (CRS's) | R? | ? | N/A? | O | O | O | N/A | N/A? | R | N/A | N/A | O | R? |
| | Client Reporting Systems | R | R | N/A? | R | R | N/A | R | N/A? | R | N/A | R | R | R |
| | | | | | | | | | | | | | | |
| (1) | Traveler originates the data, and may call to have updated or update via self-service system. | | | | | | | | | | | | | |
| | Enters data on behalf of traveler info system | | | | | | | | | | | | | |
| | Reads summaries only | | | | | | | | | | | | | |
| | System constructive as result of person's actions | | | | | | | | | | | | | |

Table 6 - Data Usage by Actor

4.3 Data Distribution Requirements

4.3.1 Data Location Transparency

From an end user perspective, the location of the data should be transparent. That is, it does not matter whether the data is located centrally or distributed across remote sites. In order to meet this requirement the data architecture must be coordinated with the infrastructure architecture to enable access to data.

4.4 Data Management Requirements

The data within the domain of the Traveler system must be monitored and controlled to maintain its integrity and provide consistent value to the business users. Essential to this goal are the requirements to provide adequate backup and recovery methods to protect valuable data and archival functionality to off load data which has become less important.

(Should we explain the likelihood that the data will reside across multiple platforms, including the CRS environments, and the need for managing this?)

4.4.1 Backup / Recovery requirements

{Assumption: A combination of 24/7 and extended business hours up time is required}

The backup requirements for data within the Traveler system must be tailored to both the business operating environment as well as to the system operational requirements. That is, data backup procedures must align with the business needs for maintaining availability of that data. For example, some backups may need to be "hot" backups which do not interfere with the access to the data. Other full off line backups should be done during scheduled business down times to provide complete recovery options.

4.4.2 Archival Requirements

The ability to selectively remove dated information and restore that data when needed is required by the Traveler system. The system must also provide a means to define the retention period for specific sets of data, based upon the business needs for that data. The interdependency of data must also be documented, so that closely related information can be archived and restored to provide a consistent data image.

The data archival process should be highly automated to minimize the human interaction required to perform this function regularly. The restoration process, however, should balance the effort required to restore the data with the likelihood that that data will need to be retrieved. That is, data which is rarely restored may require more manual procedures and support personnel involvement than data which is frequently needed. Consequently, the archival mechanisms may vary based upon the type of data involved.

Data within the Traveler system will reside in various data stores, which present unique archival and retrieval requirements. Each data environment must provide an adequate mechanism for archiving old data and retrieving that data in the event that it is needed. Some environments, such as the CRS vendors, provide archival services in electronic and other media, such as fiche. The Traveler system should leverage these capabilities when the specific data archival/retrieval requirements for that information can be met. As a general requirement, however, data restored from separate data stores must contain enough archival information to maintain synchronization of related data. For example, date and timestamp information must accompany and be presented with the information to ensure no misinterpretation of the data occurs.

The archival/retrieval methods for the Traveler system must be configurable to changing business requirements.

4.4.3 Data Consistency and Integrity Requirements

One of the primary goals for the Traveler system is to provide a new level of data congruity. Since the current systems have fragmented and inconsistent data, it becomes essential that the information presented by the Traveler system is clean, consistent and beyond question.

It is also critical that the Traveler system maintain complete financial data about the booking and ticketing transactions. The financial nature of this data requires a heightened level of data management, including the capability for full audit reporting.

5. System Management Environment

The System Management Environment (SME) requirements for the Traveler System are documented in a separate document, the Unified System Management Environment Model.

EXHIBIT C

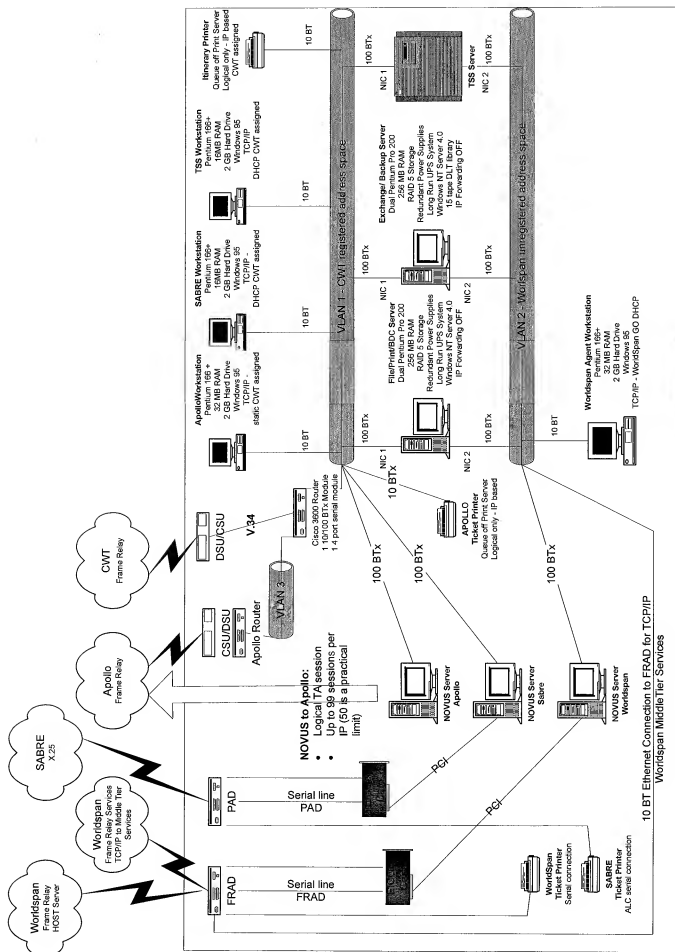
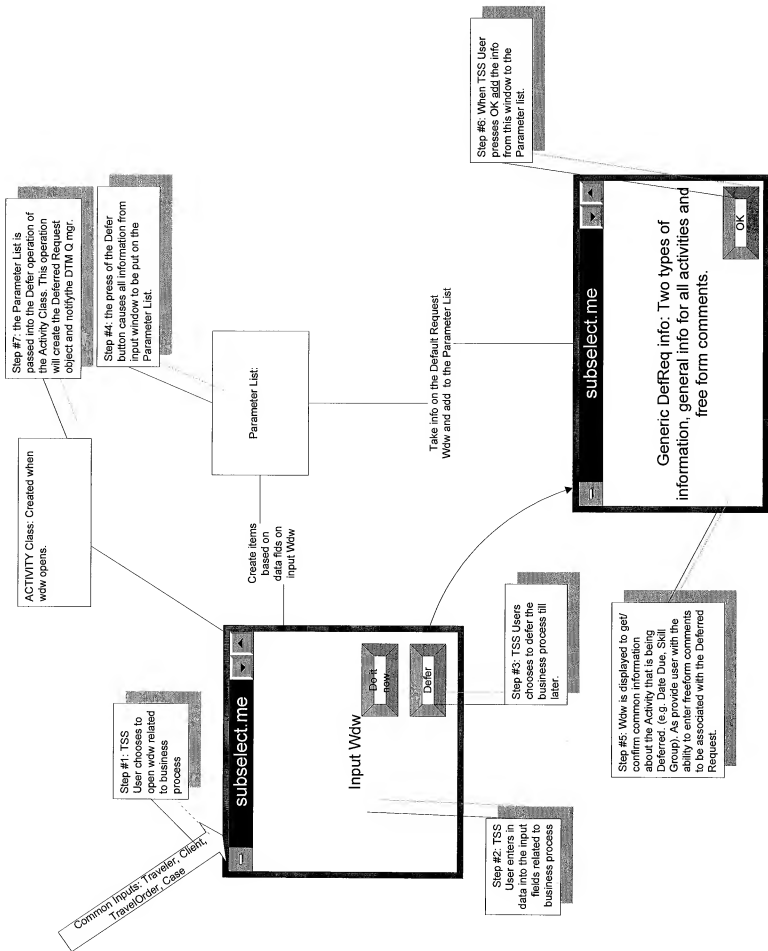


EXHIBIT D

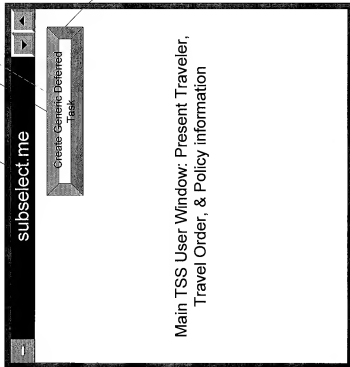


ACTIVITY Class: Created when
wvw opens. (Optional)

Step #1: TSS
User chooses to
open wvw related
to business
process

Common Inputs: Traveler,
TravelOrder, Case

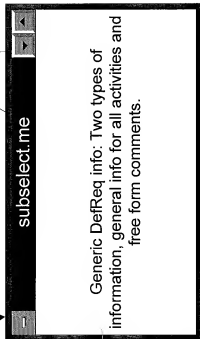
Step #2: TSS
User needs to
create a Deferred
Task



ACTIVITY Class: Created when
wvw opens. The Defer() operation is called on this to create the DeferredRequest with the info on the ParameterList

Parameter List:

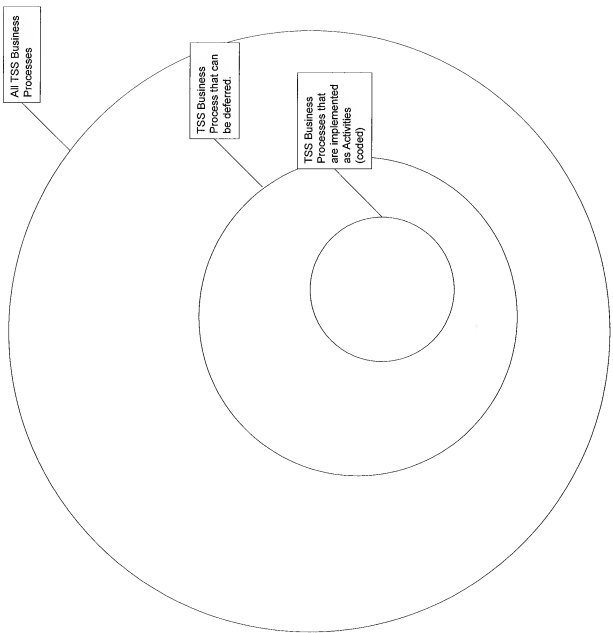
Step #4: Take information and add to a Parameter list that will be processed to create a DeferredRequest.



Step #3: TSS User is presented with a UI that prompts them for what to do / list of Business Processes) How to do it (process related to selected process) and when to do it. They can modify any of these items or add comments.

List of Non-TSS
Business Processes

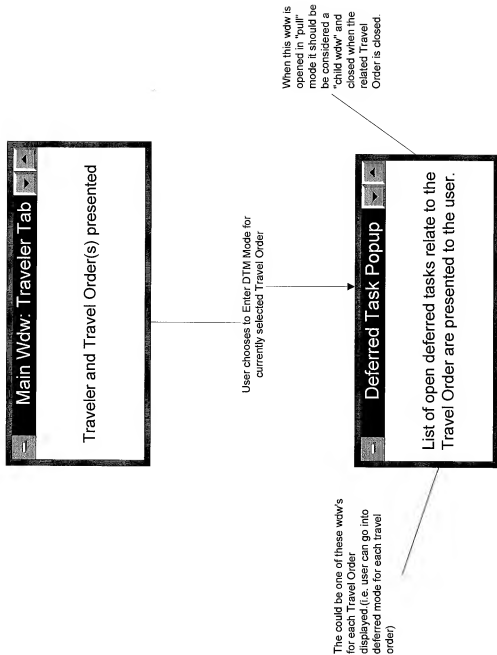
All TSS Business
Processes

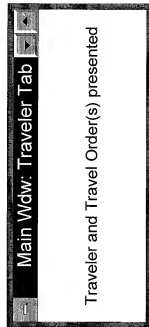


TSS Business
Process that can
be deferred.

TSS Business
Processes that
are implemented
as Activities
(coded)

PULL Scenario





What if... the TSS User closes the Travel order either before or after the Deferred Tasks are done? Should the Deferred Task Popup window be smart enough to detect this and then popup a screen for the TSS User to enter Reason Codes for tasks not done?

TSS User manually navigates to the MainWdw, identifies a Traveler and opens the specified Travel Order

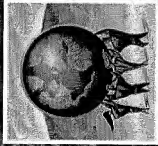
Only one Deferred Task Popup is displayed. DTm will not push other work to TSS User until they are done.



Event/message sent from DTM "engine" pops this window up on the TSS Users display.

EXHIBIT E





**Carlson
Wagonlit**
Travel

Project Mercury Traveler Service System Overview

August 9th, 1999

***** CWT Proprietary & Confidential *****

Traveler Service System History

Mendota Heights Deployment

TSS Increment 3

TSS Increment 2

TSS Increment 1

TSS Increment 0

Traveler Development Center

TSS Development Funding

Project Mercury

TSS Prototype

EWAS Project

Project Columbus

Project Magellan

Common Selling System

1999

1998

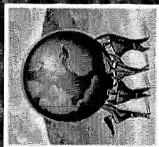
1997

1996

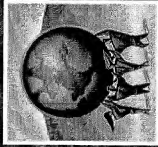
1995

Ideation Development Deployment

Carlson Wagonlit Proprietary & Confidential



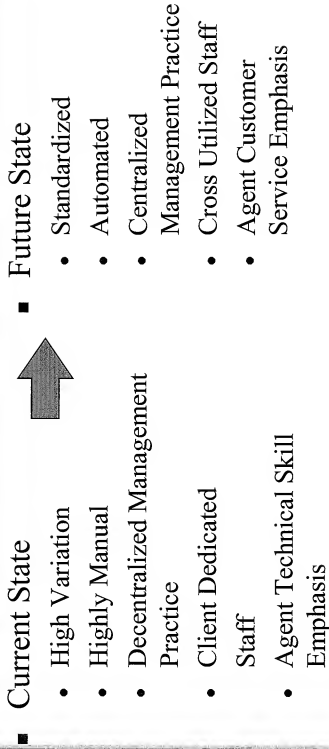
Carlson
Wagonlit
Travel

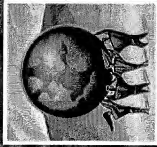


Carlson
Wagonlit
Travel™

Project Mercury

Current and Future Operations



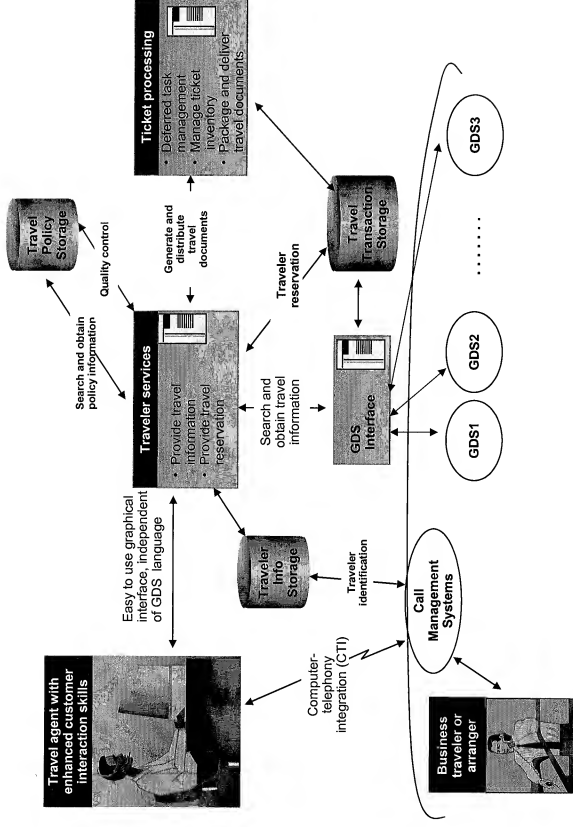


Carlson
Wagonlit
Travel™

Mercury Traveler Service System Goals

- Provide “World-Class” Service to our Clients
- Significantly Improve Agent Performance:
 - Improved Agent Utilization
 - Decreased Handle Time
- Capture and Store Key Client Data
- Interface to Financial and Information Delivery Systems
- Supplier Independence

TSS Functionality Overview

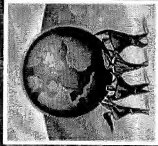




**Carlson
Wagonlit
Travel**

Traveler Service System Core Concepts

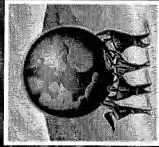
- Virtual Call Center
 - Group of call centers that serve as one
 - Groups of agents pooled across call centers
- Travel Order & Travel Components
 - Superset of CRS record (PNR)
- Service Order
 - Set of customer requests, travel orders, and issues which are related
- Offering
 - Services that a client signs up for
- Client Policy
 - Client configuration of an offering



**Carlson
Wagonlit**
Travel[®]

Traveler Service System Core Concepts (continued)

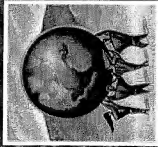
- **Workflow**
 - Management of specific steps or activities as a part of effecting efficient processes and resource utilization
- **Activities**
 - Actions a Travel Counselor performs in order to satisfy a specific traveler request
- **CRS Utilization**
 - Mitigate the financial impact of decreased CRS 'productivity'
 - Remove traveler profile information from CRS
 - Remove client reporting information from CRS



**Carlson
Wagonlit**
Travel[®]

Traveler Service System Technology Goals

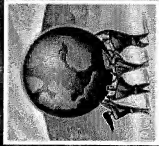
- Provide a technology foundation for delivery of travel related services to CWT's clients
 - Provide a strategic, long term solution
 - Globally deployable and scalable
 - Create common, vertical business services that can be leveraged and reused
 - Ease of maintenance and support



**Carlson
Wagonlit**
Travel™

Traveler Service System Technology Strategies

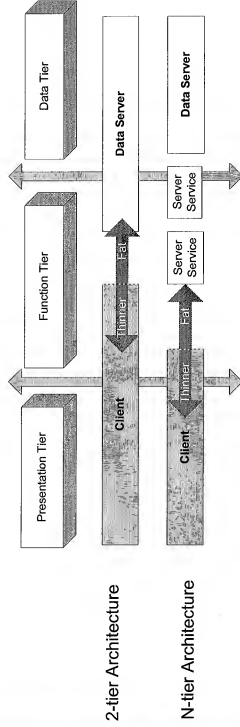
- Aligned with CWT Enterprise Wide Architecture Strategy (EWAS)
 - Support of data framework and strategies
 - Support of application framework and strategies
 - Support of infrastructure framework and strategies
 - Support of standard technologies



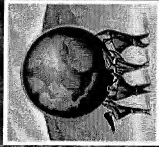
Carlson
Wagonlit
Travel

Travel Service System Application Architecture Options

Client/server Platform Architecture Options



- ◆ Object-oriented
- ◆ N-tier, layered
- ◆ Thinner client



**Carlson
Wagonlit**
Travel[®]

Traveler Service System Key Technologies

- Forte
 - Object Oriented, N-tier Environment
 - Scalable, Fault-Tolerant Transaction Processing
 - Multi-Platform
 - Multi-Lingual User Interface
- Oracle
 - Large Scale Systems
 - Replication / Parallel Processing
- TCP/IP
 - Ubiquitous Network Environment

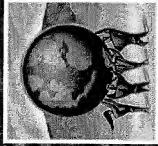
Traveler Service System Key Technologies (continued)

■ Geotel

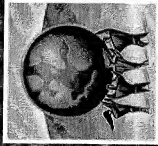
- Virtual Call Center Management
- Intelligent Call Routing
- Computer Telephony Integration
- Multi-Vendor Integration
- Self-Service IVR Integration

■ Equant

- Multiple Supplier Integration
- Structured Data Interface
- Global Experience & Support



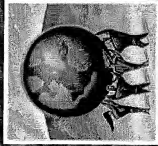
**Carlson
Wagonlit**
Travel[®]



**Carlson
Wagonlit
Travel**

Traveler System Technology Components

- Desktop Environment: NT, SMS
- File / Print / Email: NT / Exchange
- Server Platform: HP UX, NT
- Development Tools: Forte, C/C++
- Database: Oracle
- Case Tools: Select Enterprise, Systems Engineer
- SME: Microsoft SMS, Tivoli
- Network: TCP/IP, Ethernet, Frame Relay
- Telephony: Lucent, Geotel
- Other: Intersolv PVCS, Mercury Interactive



Carlson
Wagonlit
Travel

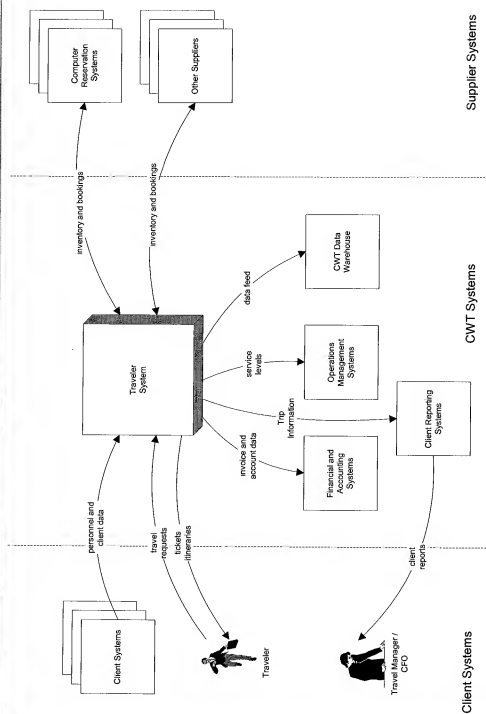
TSS Development Methodology

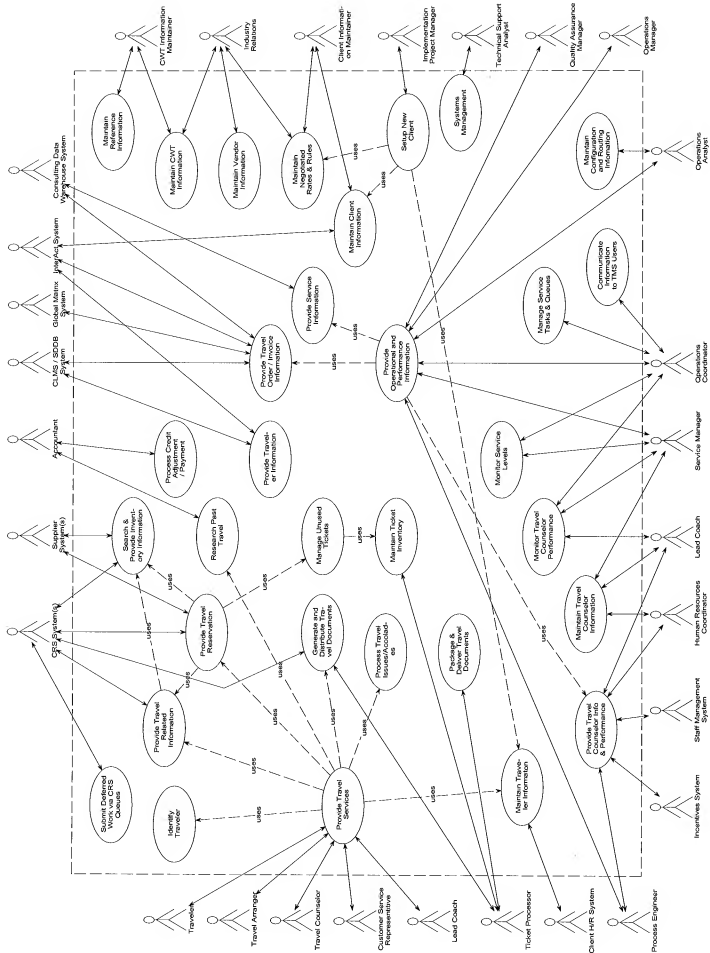
- Object Oriented Analysis and Design
 - Facilitates communication between IT development and the business community
 - Objects encapsulate both data and processing
 - Highly Structured approach
 - Architecture driven
 - Incremental and iterative

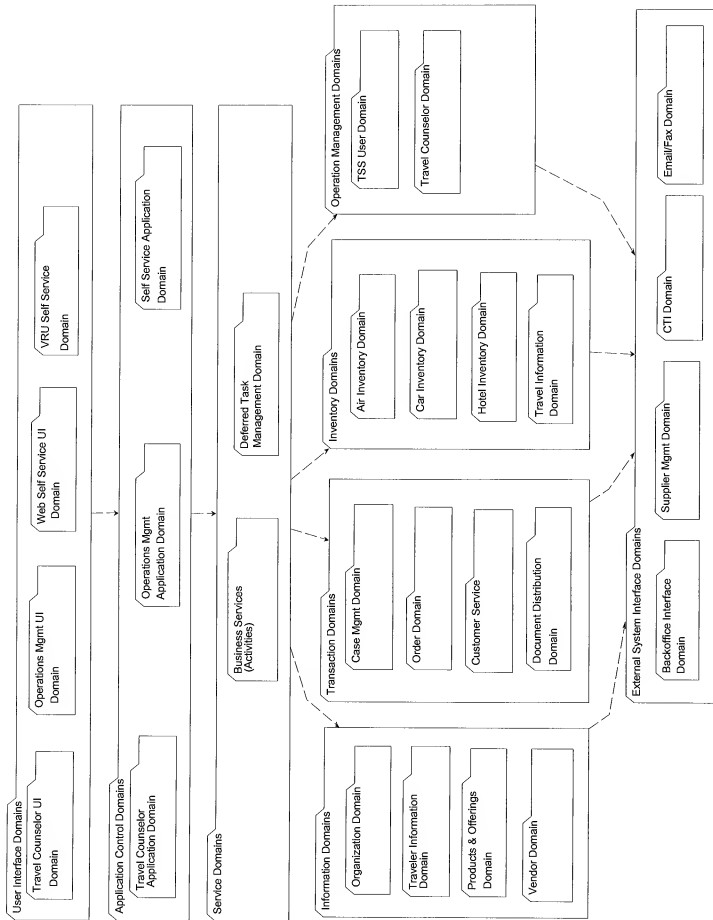


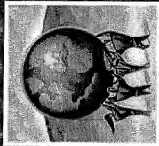
Carlson
WagonlitTM
Travel

Traveler Service System Overview

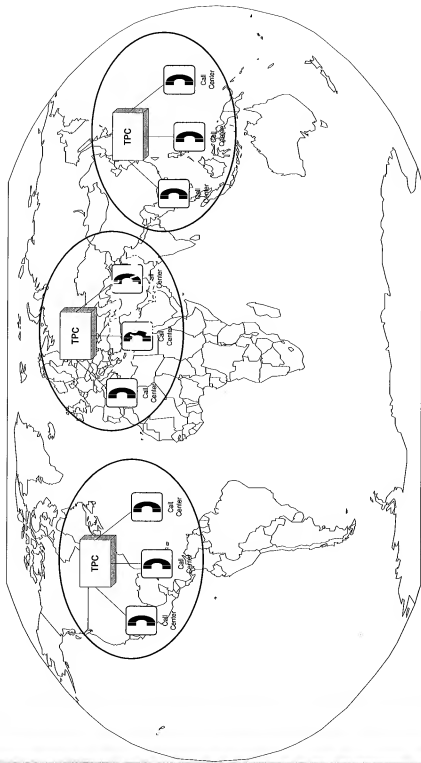








Traveler Service Network Global Regions



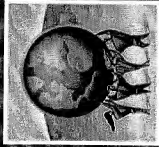
Carlson
Wagonlit[™]
Travel



**Carlson
Wagonlit
Travel**

Traveler Service Network Global Architecture

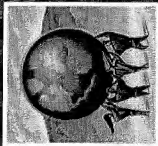
- Partitioned 'global regions'
- Each 'global region'
 - Operates independently, loosely networked
 - Large, networked call centers (voice & data)
 - Network centers - sized, disaster recovery
- Network centers
 - Enterprise services, both application & data
 - Foundation data managed at network level
 - Transaction data partitionable



**Carlson
Wagonlit**
Travel™

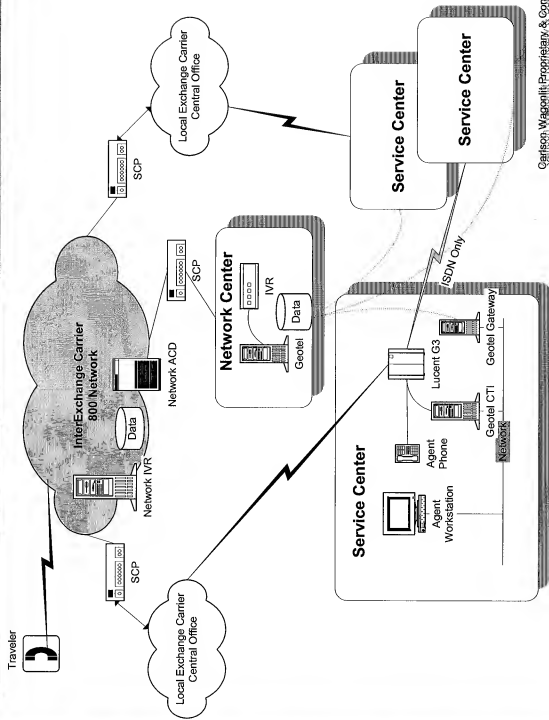
Traveler Service Network Global Architecture (continued)

- Traveler Service Centers
 - Operational and localized application services
 - Localized transaction and informational data
 - Replicated foundation data from network center
 - Mean target ~ 250 agent seats

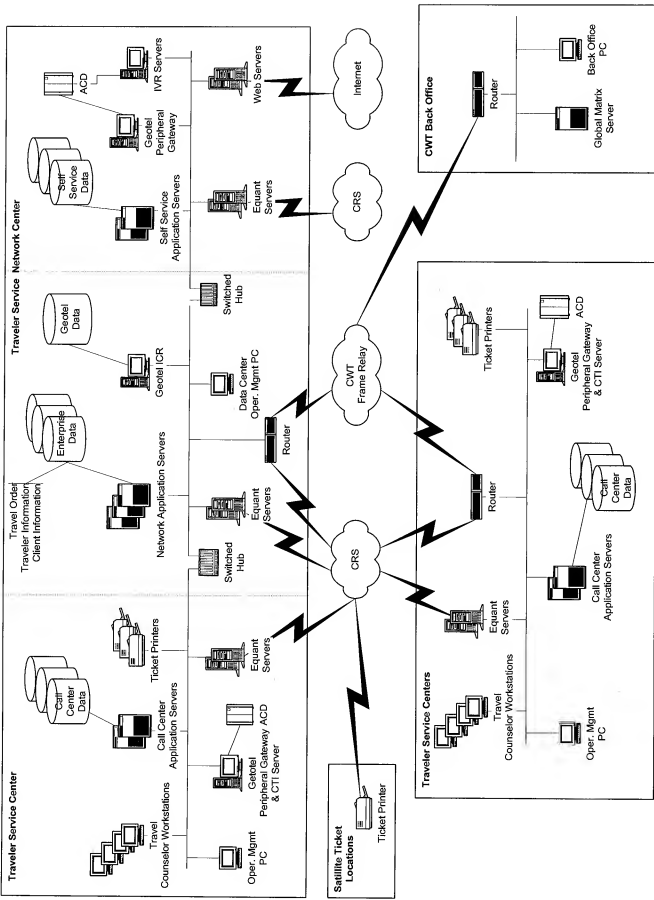


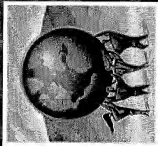
Carlson
WagonlitSM
Travel

Traveler System Network Telephony Architecture



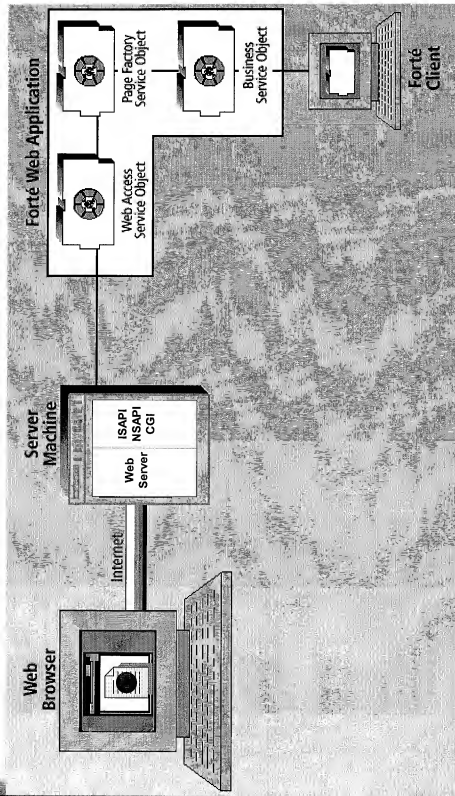
Traveler Service Network Topology

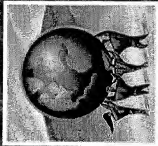




Carlson
Wagonlit
Travel

Forte Web Enterprise Architecture





Carlson
Wagonlit
Travel[®]

TSS Forte Web Architecture

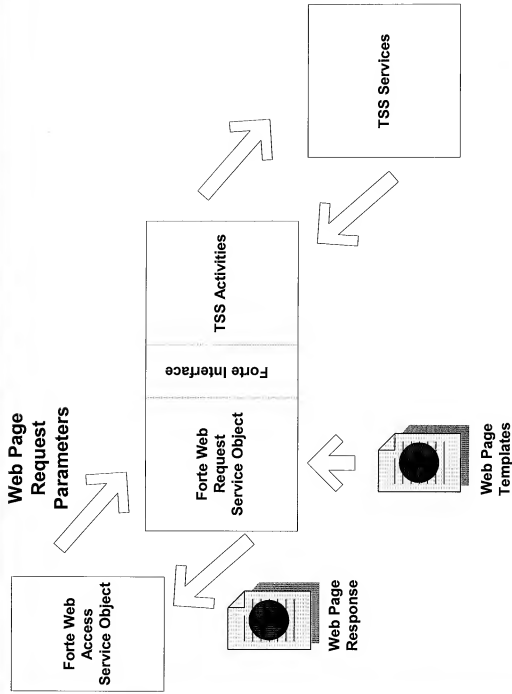


EXHIBIT F

Rodney Lacy

From: Ostlund, Scott CWT-MSP [REDACTED]
Sent: Wednesday, January 30, 2008 2:08 PM
To: Rodney Lacy
Subject: FW: First Call

Here is the original e-mail announcing the first call.

Scott Ostlund | Lead Architect, IT
Carlson Wagonlit Travel

phone [REDACTED] | mobile [REDACTED] | fax [REDACTED]

From: Schreiner, Craig CWT-MSP
Sent: Monday, June 28, 1999 9:13 AM
To: - naTRAV-TDC Bldg Staff
Subject: First Call

The first call was taken at 8:10. It was an upgrade request that was handled by Doug Harden.

EXHIBIT G

